The CHEOPS Project: CHaracterizing Exo-planets by Opto-infrared Polarimetry and Spectroscopy

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We are currently investigating the possibilities for a high-contrast, adaptive optics assisted instrument to be placed as a second-generation instrument on ESO's VLT. This instrument will consist of an "extreme-AO" system capable of producing very high Strehl ratios, a contrast-enhancing device and an integral-field spectroscopic detection system. It will be designed to directly take images of sub-stellar companions of nearby (< 100 pc) stars. We present a study of pyramid wavefront sensors for XAO systems on telescopes of 8-m diameter aperture and above. We used standard (CAOS) and custom numerical simulation tools to examine the influence of e.g. the basis set of a modal correction model, a zonal correction model, the spatial sampling of the wavefront sensor and the deformable mirror, atmospheric conditions, and optical components in the AO beam. Results of our latest simulations will be presented and the expected performance discussed.